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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/811,432	Applicant(s) RENSBURG ET AL.	
	Examiner Matthew C. Sams	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action has been changed in response to the amendment filed on 6/25/2007.

Response to Arguments

2. Applicant's arguments filed 6/25/2007 have been fully considered but they are not persuasive.
3. In response to the applicant's argument regarding claim 1 that "nothing in Guo teaches or suggests that a beam width can or should be adjusted as a function of a power control signal" (Page 18), the Examiner disagrees.

Guo teaches the "transmission beam patterns are directional, so that each transmission beam pattern points towards the corresponding mobile unit" (Col. 10 lines 17-19), "the power of each transmission beam pattern is adjusted so that the range of the beam is sufficient to allow communication with the corresponding mobile unit, without using excessive transmission power" (Col. 10 line 19-23), "the direction and power of the transmission beam patterns 20, 22, 24 are controlled adaptively to ensure that the mobile units remain within the corresponding transmission beams" (Col. 10 lines 25-28) and by "adapting the direction of the beam pattern as the mobile unit moves, the directional beam patterns can be made narrower than would otherwise be the case, allowing further reductions in overall transmission power and multiuser interference" (Col. 10 lines 46-50) which leads one of ordinary skill in the art to realize

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the mobile unit must be transmitting many power control bits (TPC) to the base station in order to keep a moving mobile unit continuously covered by a narrow transmission beam. (Col. 10 line 46-50)

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-3, 5-7, 16-18, 20-22 and 31-35 rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer et al. (US 2002/0146983 hereinafter Scherzer) in view of Guo (US-7,130,663).

Regarding claim 1, Scherzer teaches a base station (Fig. 1 [110]) capable of serving a multitude of mobile stations (Fig. 1 [121, 122 & 123]), the base station comprising:

a transceiver operable to receive from a select one of the multiple mobile stations a pilot strength signal feedback data that is used to derive a power control data; (Page 1 [0007] and Page 15 [0138]) and

beam forming circuitry operably to form a downlink traffic beam spatially directed to serve one of the multiple mobile stations with the downlink traffic beam width being set as a function of the pilot strength signal and the derived power control data. (Page 1 [0009], Page 15 [0138] and Page 16 [0139-0140]) Scherzer differs from the claimed invention by not explicitly reciting receiving a power control signal.

In an analogous art, Guo teaches adaptive beam forming using a feedback signal (Fig. 3 [DPCCH]) that includes receiving pilot bits (Fig. 3 [PILOT]) and transmit power control bits. (Fig. 3 [TPC], Col. 9 line 59 through Col. 10 line 34 and Col. 10 lines 46-50) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the invention of Scherzer after modifying it to incorporate the feedback signals of Guo. One of ordinary skill in the art would have been motivated to do this since the technique provides for less complex feedback information to be transmitted from the mobile unit to a base station. (Col. 2 lines 26-31)

Regarding claim 2, Scherzer in view of Guo teaches an adaptive antenna array connected to the beam forming circuitry to facilitate forming the downlink beam. (Scherzer Page 1 [0009])

Regarding claim 3, Scherzer in view of Guo teaches beam forming circuitry operable to provide channels for the traffic and a channel for the pilot signal for serving multiple mobile stations. (Scherzer Page 9 [0077])

Regarding claim 5, Scherzer in view of Guo teaches the pilot beam carries a pilot signal for use by multiple mobile stations and the pilot strength signal is generated by one of the mobile stations in response to the pilot signal received by one of the mobile stations. (Scherzer Page 1 [0009], Page 15 [0138] and Page 16 [0139-0140])

Regarding claim 6, Scherzer in view of Guo teaches the traffic beam carries traffic signals associated with one of the multiple mobile stations and the power control signal is generated by one of the multiple mobile stations in response to the traffic signal received by one of the multiple mobile stations. (Scherzer Page 7 [0059] through Page 8 [0067] & Page 15 [0138] through Page 16 [0140])

Regarding claim 7, Scherzer in view of Guo teaches the power control signal requests the base station to increase or decrease the power of the traffic signal. (Scherzer Pages 15-16 [0139] and Guo Col. 9 line 65 through Col. 10 line 34)

Regarding claim 16, the limitations of claim 16 are rejected as being the same reason set forth above in claim 1.

Regarding claim 17, the limitations of claim 17 are rejected as being the same reason set forth above in claim 2.

Regarding claim 18, the limitations of claim 18 are rejected as being the same reason set forth above in claim 3.

Regarding claim 20, the limitations of claim 20 are rejected as being the same reason set forth above in claim 5.

Regarding claim 21, the limitations of claim 21 are rejected as being the same reason set forth above in claim 6.

Regarding claim 22, the limitations of claim 22 are rejected as being the same reason set forth above in claim 7.

Regarding claim 31, the limitations of claim 16 are rejected as being the same reason set forth above in claim 1.

Regarding claim 32, the limitations of claim 17 are rejected as being the same reason set forth above in claim 2.

Regarding claim 33, the limitations of claim 18 are rejected as being the same reason set forth above in claim 3.

Regarding claim 34, the limitations of claim 34 are rejected as being the same reason set forth above in claim 5.

Regarding claim 35, the limitations of claim 35 are rejected as being the same reason set forth above in claim 6.

7. Claims 4 & 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Guo as applied to claims 3 & 18 above, and further in view of Wong et al. (US-6,453,177 hereafter, Wong).

Regarding claim 4, Scherzer in view of Guo teaches the limitations of claim 3 above, but differs from the claimed invention by not explicitly reciting the pilot beam width is wider than the traffic beam.

In an analogous art, Wong teaches a pilot beam width that is 3-dB wider than the traffic beam. (Col. 15 lines 1-10) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the wireless communication system of Scherzer in view of Guo after modifying it to incorporate the pilot beam width

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of Scherzer. One of ordinary skill in the art would have been motivated to do this since the traffic beam carries more information and can be the source of more interference; so focusing the beam's direction can limit interference sources.

Regarding claim 19, the limitations of claim 19 are rejected as being the same reasons set forth above in claim 4.

8. Claims 8 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Guo as applied to claims 1 & 16 above, and further in view of Love (US-6,148,208).

Regarding claim 8, Scherzer in view of Guo teaches the limitations of claim 1 above, but differs from the claimed invention by not explicitly reciting the power control signal comprises a digital gain unit.

In an analogous art, Love teaches power control in a communication system that includes a power control signal that comprises digital gain units. (Col. 7 lines 24-44) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the communication system of Scherzer in view of Guo after modifying it to incorporate the power control signal of Love. One of ordinary skill in the art would have been motivated to do this since the power control signals allows maintaining an acceptable quality of service while using a minimum amount of transmission power. (Col. 1 lines 41-62)

Regarding claim 23, the limitations of claim 23 are rejected as being the same reason set forth above in claim 8.

9. Claims 9, 10, 24, 25 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Guo as applied to claims 1, 16 & 36 above, and further in view of Judson (US-7,054,662).

Regarding claim 9, Scherzer in view of Guo teaches the limitations of claim 1 above and that pilot channel updates, transmit power control updates and beam feedback information are all received in the same time slot (Guo Col. 9 lines 39-58 and Figs. 2 & 3), but differs from the claimed invention by not explicitly reciting receiving beam updates less frequently than the power control and pilot signal updates.

In an analogous art, Judson teaches a system for forward link beam forming in a CDMA cellular communication system (Col. 3 lines 33-61 and Col. 4 lines 40-67) that includes receiving beam updates (Col. 6 line 15 through Col. 7 line 18, Col. 8 lines 11-25 and Fig. 3) less frequently than the power control updates. (Col. 5 lines 54-57) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the wireless network of Scherzer in view of Guo after modifying it to include beam update timing of Judson. One of ordinary skill in the art would have been motivated to do this since optimizing beam formation and orientation can minimize interferences and increases the system's capacity. (Col. 7 lines 28-33)

Regarding claim 10, Scherzer in view of Guo and Judson teaches power control signals are received every 1.25 msec (Judson Col. 6 lines 54-57) and the beam update time is 100 msec. (Judson Col. 8 lines 11-25)

Regarding claim 24, the limitations of claim 24 are rejected as being the same reason set forth above in claim 9.

Regarding claim 25, the limitations of claim 25 are rejected as being the same reason set forth above in claim 10.

Regarding claim 36, the limitations of claim 36 are rejected as being the same reason set forth above in claim 9.

10. Claims 11-15, 26-30 & 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Guo and Judson as applied to claim 9 above, and further in view of Xiao et al. (US-2004/0023659 hereafter, Xiao).

Regarding claim 11, Scherzer in view of Guo and Judson teaches the limitations of claim 9 above, but differs from the claimed invention by not explicitly reciting the calculation of a differential pilot strength signal and a differential power control.

In an analogous art, Xiao teaches a pilot information gain control method that includes determining a differential pilot strength signal and transmitting differential power control information. (Page 2 [0023-0025]) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the communication system of Scherzer in view of Guo and Judson after modifying it to incorporate the differential power control of Xiao. One of ordinary skill in the art would have been motivated to do this since having differential power control information of pilot channels informs the base station of the reception conditions at the location of the mobile device.

Regarding claim 12, Xiao further teaches the differential power control comprises a cumulative value of power control signal over the beam update time. (Xiao Page 2 [0023])

Regarding claim 13, Xiao further teaches the differential power control corresponds to a difference between a value of the power control signal at a first time in the beam update time and a value of the power control signal at a second time in the beam update time. (Xiao Page 2 [0023] e.g. function)

Regarding claims 14 and 15, Scherzer in view of Guo, Judson and Xiao teaches incrementally changing the power control information (Xiao Page 2 [0023-0025]) and increasing/decreasing the beam width with power increases/decreases. (Scherzer Page 7 [0061])

Regarding claim 26, the limitations of claim 26 are rejected as being the same reason set forth above in claim 11.

Regarding claim 27, the limitations of claim 27 are rejected as being the same reason set forth above in claim 12.

Regarding claim 28, the limitations of claim 28 are rejected as being the same reason set forth above in claim 13.

Regarding claims 29 & 30, the limitations of claims 29 & 30 are rejected as being the same reason set forth above in claims 14 & 15.

Regarding claim 37, the limitations of claim 37 are rejected as being the same reason set forth above in claim 11.

Regarding claim 38, the limitations of claim 38 are rejected as being the same reason set forth above in claim 12.

Regarding claim 39, the limitations of claim 39 are rejected as being the same reason set forth above in claim 13.

Regarding claims 40 & 41, the limitations of claims 40 & 41 are rejected as being the same reason set forth above in claims 14 & 15.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Sams whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571)272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MCS

8/24/2007



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